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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,734	06/27/2003	Arthur E. Barnes	2149-00300	7757
23505	7590	11/15/2004	EXAMINER	
CONLEY ROSE, P.C.			LAU, TUNG S	
P. O. BOX 3267			ART UNIT	
HOUSTON, TX 77253-3267			PAPER NUMBER	
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DATE MAILED: 11/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/608,734	Applicant(s) BARNES, ARTHUR E.	
	Examiner Tung S Lau	Art Unit 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-65 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 8-11, 15-26, 28, 30-33, 37-52, 56-61, 64 and 65 is/are rejected.
- 7) ☒ Claim(s) 5, 7, 12-14, 27, 29, 34-36, 53-55, 62 and 63 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>see office action</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. Information Disclosure Statement filed on 6-27-2003 is acknowledged by the examiner; A copy of a signed PTO-1449 attached with this office action.

The information disclosure statement filed 6-27-2003 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the date of the publication of the references is/are missing. It has been placed in the application file, but the information referred to therein has not been considered as to the merits (items AN, AO, AP). Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 C(1).

Specification objections

2. Applicant is reminded of the proper language and format for an abstract of the disclosure. The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The

form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

'Comprises' is an improper legal phraseology often used in patent claims and should be avoided.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6, 8-11, 15-26, 28, 30-33, 37-46, 48-52, 56-61 and 64 are rejected under 35 U.S.C. 102(b) as being anticipated by Gassaway et al. (U.S. Patent 4,528,649).

Regarding claim 1:

Gassaway discloses a method of measuring continuity of a data set, the method comprising: obtaining a vector set from the data set; combining vectors from the

Art Unit: 2863

vector set to determine a representative vector for the vector set; and calculating a continuity measurement for the vector set (Col. 2-3, Lines 20-2).

Regarding claim 18:

Gassaway discloses a method of measuring continuity of a data set, the method comprising: obtaining a vector set from the data set (Col. 2-3, Lines 20-2); determining a representative vector for the vector set; and calculating a continuity measurement for the vector set, wherein said calculating includes: finding for each vector in the vector set a projection value indicative of a projection of the vector along a line defined by the representative vector (Col. 2-3, Lines 20-2).

Regarding claim 23:

Gassaway discloses a method of measuring discontinuity of a data set, the method comprising: obtaining a vector set from the data set; combining vectors from the vector set to determine a representative vector for the vector set; and calculating a discontinuity measurement for the vector set (Col. 2-3, Lines 20-2).

Regarding claim 40:

Gassaway discloses a method of measuring discontinuity of a data set, the method comprising: obtaining a vector set from the data set; determining a representative vector for the vector set (Col. 2-3, Lines 20-2); and calculating a discontinuity measurement for the vector set, wherein said calculating includes: finding for each vector in the vector set a projection value indicative of a projection of the vector perpendicular to a line defined by the representative vector (Col. 2-3, Lines 20-2, fig. 1, 4a-4c).

Art Unit: 2863

Regarding claim 45:

Gassaway discloses a method of seismic exploration that comprises: detecting seismic energy with an array of detectors, converting detection signals from the array of detectors into data representing one or more attributes as a function of position for subsurface formations (Col. 2-3, Lines 20-2); systematically obtaining subsets of the data as vector sets; and for each vector set combining vectors from the vector set to determine a representative vector for the vector set and calculating a continuity or discontinuity measurement with respect to the representative vector (Col. 2-3, Lines 20-2).

Regarding claim 56:

Gassaway discloses a seismic survey system comprising: a data storage device that stores seismic measurements; a processor (fig. 18, unit 251) that retrieves said seismic measurements as one or more vector sets and combines vectors from at least one of the vector sets to determine a representative vector (Col. 2-3, Lines 20-2), wherein said processor calculates a continuity or discontinuity measurement with respect to the representative vector (Col. 2-3, Lines 20-2).

Regarding claim 2, Gassaway discloses calculating a continuity measurement includes finding for each vector in the vector set a projection value indicative of a projection of the vector along a line of similarity defined by the representative vector (fig. 1-3); Regarding claims 3, 19, 30, 41, 49, 57, Gassaway discloses summing square of the value (Col. 4, Lines 28-68, Col. 15-16, Lines 66-38);

Regarding claims 4, 6, 20, 21, 42, Gassaway discloses normalizing the sum of square (Col. 4, Lines 28-68, Col. 15-16, Lines 66-38); Regarding claim 8, Gassaway discloses summing vector set (fig. 9-11); Regarding claims 9, 50, 58, Gassaway discloses dividing sum of vector to obtain average (Col. 7, Lines 30-65, Col. 15-16, Lines 66-38); Regarding claims 10, 11, 32, 51, 59, Gassaway discloses determine sum of weight in the vector (Col. 2, Lines 20-67); Regarding claims 15, 37, Gassaway discloses repeating combining and calculating set of continuity measurements each having a spatial position (Col. 2-3, Lines 20-3, fig. 1-3); Regarding claim 16, Gassaway discloses function of spatial position (Col. 2-3, Lines 20-3, fig. 1-3); Regarding claims 17, 22, 39, 44, Gassaway discloses data derived from seismic survey (abstract); Regarding claim 24, Gassaway discloses calculating a discontinuity measurement includes finding for each vector in the vector set a projection value indicative of a projection of the vector perpendicular to a line defined by the representative vector (fig. 4b); Regarding claim 25, Gassaway discloses sum square projection relative sum of square (Col. 15-16, Lines 62-38); Regarding claim 26, 28, Gassaway discloses normalize sum square projection of the vector (Col. 15-16, Lines 62-38);); Regarding claim 31, Gassaway discloses dividing sum of vector (Col. 7-8, Lines 25-25); Regarding claims 33, 52, 60, Gassaway discloses minimize total distance of the vector set (fig. 2, 3 Col. 7-8, Lines 25-3, fig. 9-11); Regarding claims 38, 64, Gassaway discloses displaying function (fig. 18, unit 259); Regarding claim 43, Gassaway discloses normalize square, averaging data set (Col. 7, Lines 30-65, Col. 15-16,

Lines 66-38); Regarding claim 46, Gassaway discloses continuity or discontinuity as function of the position (abstract); Regarding claims 48, Gassaway also discloses two, three dimensional map (fig. 9-11, 4a-4c); Regarding claims 61, Gassaway discloses representative of at least one of vector sets (fig.2, 3).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

a. Claims 65, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gassaway et al. (U.S. Patent 4,528,649).

Gassaway discloses a method of seismic exploration that comprises: detecting seismic energy with an array of detectors, converting detection signals from the array of detectors into data representing one or more attributes as a function of position for subsurface formations; systematically obtaining subsets of the data ms vector sets; and for each vector set averaging vectors from the vector set to determine a representative vector for the vector set; calculating a continuity or discontinuity measurement with respect to the representative vector, and providing a display with the continuity or discontinuity measurement.

Gassaway did not disclose to display in color, however, It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gassaway to have the display in color in order to shown better contrast differences in the measuring of the geological site.

Claim Objections

5. Claims 5, 7, 12, 13, 14, 29, 27, 34, 35, 36, 53, 54, 55, 62, 63 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitation of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: prior art fail to teach: regarding claims 5, 27,

$$C = \frac{\sum_i \beta_i^2}{\sum_i E_i},$$

wherein C represents the continuity measurement, β_i represents the projection value for vector i , E_i represents an energy of vector i , and i represents an index that ranges over the vector set.

regarding claims 7, 29,

$$C = \frac{1}{N} \sum_{i=1}^N \frac{\beta_i^2}{E_i},$$

wherein C represents the continuity measurement, β_i represents the projection value for vector i , E_i represents an energy of vector i , i represents an index that ranges over the vector set, and N represents a number of vectors in the vector set.

Art Unit: 2863

regarding claims 12, 34, 53, Manhattan distance measurement; regarding claims 13, 35, 54, 62 use of neural network

Claim 14 is objected due to their dependency on claim 13.

Claim 36 is objected due to their dependency on claim 35.

Claim 55 is objected due to their dependency on claim 54.

Claim 63 is objected due to their dependency on claim 62.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung S Lau whose telephone number is 571-272-2274. The examiner can normally be reached on M-F 9-5:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 571-272-2269. The fax phone numbers for the organization where this application or proceeding is assigned is 703-872-9306

Art Unit: 2863

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TL



~~MICHAEL NGHIEM
PRIMARY EXAMINER~~

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11/10/04